ROYAL ASTRONOMICAL SOCIETY.

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CAPT. W. H. SMYTH, Vice-President, in the Chair.

The late Dr. Pearson bequeathed to the Society all the stock of *Introduction to Practical Astronomy* remaining unsold at his death. There are about 100 copies of the entire work, and 400 copies of the first volume, which contains the tables.

The Council have resolved to sell these at the following prices to fellows and associates of the Society :—

	£	s.	d.
The whole work, 2 vols. text, and 1 of plates	1	1	0
The 1st vol., containing all the tables	0	5	0

The price to non-members is double.

It is desirable that those fellows who wish to purchase the work should give immediate notice to the Assistant-secretary.

FLORA.

Observations compared with Mr. Hind's Ephemeris in the *Monthly Notices*, Nos. 2 and 3 of Vol. VIII.

CAMBRIDGE. On the Meridian. (Professor Challis.)

1848.	Greenwich M.T. h m s	R.A. h m s	Obs^{d}—Cal^{d} s	N.P.D. ° ′ ″	Obs^{d} -Cal^{d} ″
Jan. 4	9 15 22·9	4 10 13·43	+0·07	73 55 9·0	−0·7
5	9 11 14·5	10 0·88	+0·27	49 58·3	+2·1
11	8 47 12·0	9 33·78	−0·23	73 17 10·1	−1·7
15	31 57·5	10 3·06	+0·17		
16	8 28 14·4	10 15·84	+0·03	72 48 22·6	+3·0
Feb. 1	7 33 30·0	18 27·35	−0·62		
2	7 30 21·2	4 19 14·59	−0·61		

With the Northumberland Equatoreal.

1848.	Greenwich M.T. h m s	R.A. h m s	Obs^{d}—Cal^{d} s	N.P.D. ° ′ ″	Obs^{d}—Cal^{d} ″	No. of Comps. Star. R.A.	N.P.D.	
Feb. 16	7 31 53·7	4 33 12·62	−0·61	69 38 33·0	− 1·8	1	1	*a*
	8 3 27·1	13·92	0·86	31·3	+ 4·3	9	9	*b*
	8 31 54·9	15·34	0·83	24·4	+ 4·5	1	1	*c*
17	7 49 47·9	34 24·35	−0·97	32 42·4	+ 7·6	1	1	*c*
	8 1 30·9	34 26·28	+0·38	26·3	− 5·6	3	3	*d*
18	7 20 48·3	35 36·80	+0·41	69 26 44·3	− 4·3	6	6	*d*
25	8 19 1·5	44 42·22	−1·03	68 46 36·8	− 1·2	6	6	*e*
28	10 31 22·3	49 1·51	0·66	29 50·4	+ 2·4	6	6	*f*
Mar. 3	10 42 10·8	4 54 52·24	1·19	68 8 48·1	− 2·4	7	7	*f*
10	8 32 17·5	5 5 36·15	1·02	67 35 11·9	5·9	9	9	*g*
14	9 6 45·3	12 10·94	0·97	17 13·7	12·6	8	8	*h*
18	9 24 9·3	18 57·40	1·04	67 0 43·3	15·8	6	6	*i*
20	8 8 36·9	22 18·51	1·55	66 53 21·3	9·0	1	1	*j*
	8 40 43·5	21·15	1·24	12·6	12·7	12	5	*k*
21	8 7 50·0	24 3·19	1·38	49 45·1	3·0	1	1	*j*
	8 26 41·2	4·61	1·33	28·7	16·5	10	10	*k*
28	7 46 5·4	36 32·43	0·70	26 24·4	− 8·2	2	2	*l*
29	8 27 22·7	38 24·81	1·10	23 35·4	+ 4·4	8	8	*m*
April 1	8 9 23·9	43 56·10	0·75	15 17·5	− 2·3	9	6	*n*
6	9 30 53·3	5 53 26·75	0·97	66 3 28·2	− 5·7	7	7	*o*
10	10 42 42·1	6 1 12·71	0·75	65 56 9·7	+ 4·1	7	7	*p*
14	8 20 5·2	8 47·42	0·93	50 22·4	−12·0	9	9	*q*
17	8 45 2·8	14 43·32	0·59	47 17·3	9·7	2	2	*r*
	8 48 12·2	43·50	0·66	17·9	9·0	9	9	*s*
19	9 2 24·3	18 41·61	0·95	45 41·0	15·0	1	1	*t*
	9 12 49·9	42·63	0·82	41·3	14·2	8	8	*u*
28	8 55 38·6	36 42·74	0·54	44 31·1	9·8	10	5	*v*
	8 55 38·6	42·34	0·94	27·0	13·8	10	6	*w*
29	8 27 59·7	6 38 41·80	0·47	65 44 55·2	10·8	2	2	*x*
	8 53 54·6	43·90	−0·56	53·1	−13·4	7	7	*v*

"The observed places are corrected for refraction and parallax, and the calculated places for aberration.

"The mean places of the following reference stars were derived from the authorities cited below, by applying the annual and secular variations. Where two authorities are mentioned, the mean of the two results is adopted :—

a... B.A.C. 1417

c { H.C. 8705 / B.Z. 343 : $4^{h}\ 27^{m}\ 33^{s}$

d... H.C. 8798

e... H.C. { 9228 / 9229

f... B.A.C. 1551

g... B.A.C. 1620

j... H.C. 10208

l... B.A.C. 1801

m { H.C. 10844 / B.Z. 348 : $5^{h}\ 34^{m}\ 46^{s}$

n { H.C. 11048 / B.Z. 348 : $5^{h}\ 40^{m}\ 4^{s}$

o... { H.C. 11356 / B.Z. 348 : $5^{h}\ 50^{m}\ 17^{s}$

p... B.A.C. 1981

q... B.A.C. 2011

r... B.A.C. 2042

t... B.Z. 348 : $6^{h}\ 14^{m}\ 7^{s}$

"The star x is B.A.C. 2238, the adopted mean place of which, 1848·0, as determined by one transit and two circle observations in 1847, is R.A. $6^h\,42^m\,46^s{\cdot}01$, N.P.D. 66° 13′ 25″·4.

"The remainder are unknown stars, the following adopted apparent places of which, obtained by one, or at most by two, equatoreal comparisons with the known stars, can only be regarded as approximate:—

Star.	Apparent R.A. h m s	Apparent N.P.D. ° ′ ″	By Comparison with
b	4 32 26·64	69 41 49·7	H.C. 8705
h	5 11 35·04	67 19 56·5	B.A.C. 1620
i	5 18 7·33	67 1 44·5	H.C. 10208
k	5 21 51·77	66 54 38·7	— —
s	6 13 58·77	65 48 16·2	B.A.C. 2042
u	6 17 44·43	66 11 9·9	B.Z. 348, $6^h\,14^m{\cdot}7^s$
v	6 36 20·58	65 43 19·8	B.A.C. 2238
w	6 37 13·04	65 45 30·0	— —

MARKREE. Meridian Circle. (E. J. Cooper, Esq. & Mr. Graham.)

Greenwich M.T. 1847. d	R.A. h m s	Decl. ° ′ ″	Parallax.
Nov. 17·569130	4 51 40·14	+13 47 9·0	+[9·810] *p*
25·541658	43 32·45	13 53 22·1	9·809
30·524187	38 1·65	14 0 34·0	9·808
Dec. 3·513676	34 40·71	14 6 6·9	9·807
18·462247	19 33·41	14 48 53·2	9·800
20·455666	17 56·35	14 56 25·5	9·800
30·424155	11 51·88	15 39 54·0	9·792
1848. Jan. 3·412267	10 28·25	15 59 42·3	9·788
5·406488	10 0·68	16 10 4·2	9·787
11·389680	9 34·29	16 42 49·3	9·781
14·381822	9 52·68	16 59 59·5	9·779
15·379396	10 3·24	17 5 48·1	9·778
19·369046	11 8·54	17 29 30·8	9·774
24·356887	13 17·89	17 59 53·0	9·768
25·354526	13 50·02	18 6 0·6	9·767
28·347583	15 38·09	18 24 34·6	9·764
31·340835	17 43·22	18 43 12·2	9·761
Feb. 12·315677	28 42·16	19 57 9·0	9·747
15·309798	32 2·66	20 15 13·3	9·744
25·291212	44 37·85	21 12 53·0	9·733
26·289433	4 46 0·28	+21 18 23·0	+[9·732] *p*

NOTES.

1848.
Jan. 11. Bad illumination; observation uncertain in consequence. Got 5 wires.
15. Got but 4 wires. Clouded at first three.
19. Very faint. Seen through clouds.
25. A 9½ mag. star (same declination) about 15^s following.
Feb. 25. Very faint.

Equatoreal and Square-bar Micrometer.

Greenwich M.T. 1847.	d	R.A. h	m	s	Parallax.	Decl. °	′	″	Parallax.
Oct.	27·493196	5	3	52·43	−[8·498] *p*	+13	54	44·5	+[9·843] *p*
Nov.	2·606546		2	5·93	[7·437]	13	49	43·9	9·810
	5·481421	5	0	43·81	[8·461]	13	48	4·4	9·837
	17·470484	4	51	46·70	[8·371]	13	47	11·8	9·827
	19·489789		49	49·73	[8·251]	13	48	4·1	9·819
	25·496986		43	35·23	[8·048]	13	53	25·1	9·813
	27·424133		41	29·05	−[8·324]	13	55	47·0	9·822
1848. Feb.	2·413464		19	19·11	+[8·286]	18	55	59·1	9·776
	9·366218		25	37·55	[8·061]	19	39	6·0	9·757
	11·500694		27	48·56	[8·580]	19	52	6·1	9·832
	17·461166		34	33·83	[8·540]	20	27	58·6	9·808
	18·484396		35	47·74	[8·579]	20	34	2·1	9·826
	28·399010		48	58·49	[8·440]	21	29	50·5	9·771
March	1·402994	4	51	50·79	[8·463]	21	40	27·3	9·774
	7·341941	5	0	49·66	[8·254]	22	10	14·3	9·739
	24·412996		29	29·41	[8·568]	23	21	5·0	9·796
	25·388964		31	14·07	[8·527]	23	24	17·2	9·777
	27·413143		34	53·05	[8·576]	23	30	33·2	9·800
	28·388962		36	39·58	[8·537]	23	33	35·8	9·779
	30·429934		40	24·07	[8·602]	23	39	22·4	9·817
	31·507438		42	23·78	[8·624]	23	42	24·0	9·891
April	8·451371	5	57	21·60	[8·627]	24	0	34·4	9·848
	10·444793	6	1	12·83	[8·626]	24	3	57·2	9·848
	13·412816		6	57·87	[8·607]	24	8	18·9	9·818
	24·441495		29	48·65	[8·632]	24	15	51·4	9·857
	25·441903		30	48·93	[8·632]	24	15	57·0	9·859
	26·409492		32	45·29	[8·619]	24	16	1·5	9·830
	29·415226	6	38	49·76	+[8·625] *p*	+24	14	57·8	+[9·892] *p*

Stars of Comparison and Notes.

1847. Oct. 27	Bessel	v. 54	Sixteen comparisons.
Nov. 2	—	11	Eleven comparisons.
5	—	11	H. C. 9671, 9714.
17	—	iv. 1199	H. C. 9417. *Flora* appears to have occulted a minute star about the time of culmination.
19	—	1081, 1086, 1096	Weisse gives for the right ascension of this last $4^h\ 48^m\ 27^s{\cdot}63$; it should be $4^h\ 48^m\ 26^s{\cdot}63$, as I have taken it in the reduction. Baffled by clouds. Instrument greatly shaken by wind.
25	B.A.C.	1500	H. C. 9074.
27	—	—	Do.
1848. Feb. 2	—	1376	The instrument was greatly shaken by the wind, and I fear even moved in right ascension: so that there is little confidence to be placed in this observation.
9	—	1417	Piazzi v. 119, 120.
11	—	—	— — — The planet is becoming much fainter. This night I estimate it at not more than $9\frac{1}{2}$ magnitude. Strong moonlight, however.

1848.
Feb. 17 B.Z. 343 ; $4^h\ 32^m\ 22^s{\cdot}00$. H. C. 8844. *Flora* rapidly diminishes in magnitude. It cannot to-night be more than 10^m.

18 — — Another star, H.C. 8798, with which the planet was compared, gives for the planet's place—
$4^h\ 35^m\ 50^s{\cdot}12 + 20^\circ\ 34'\ 18''{\cdot}2$
It was judged safer to adopt the former determination from a star in which Lalande and Bessel agree so closely.

28 B.Z. 393 ; $4^h\ 45^m\ 41^s{\cdot}03$. H. C. 9228, 9229. Four comparisons. Clouds and wind. The latter, it is to be feared, affected the observation.

March 1 B.A.C. 1551.

7 B.Z. 334; $5^h\ 0^m\ 35^s{\cdot}20$. The star B.Z. 334, $5^h\ 0^m\ 33^s{\cdot}71$, was also taken at the same time. It gives for the planet—
$5^h\ 0^m\ 48^s{\cdot}65 + 22^\circ\ 10'\ 16''{\cdot}0$
The former star was much more favourably situated for the comparison : and we therefore inserted in the text the result from it, instead of taking a mean. Nine comparisons. Planet $10\frac{1}{2}$ magnitude. There was a haze which rendered the planet barely visible. Cannot depend on this observation.

24 B.A.C. 1774.

25 B.A.C. 1774 B.Z. 521 ; $5^h\ 31^m\ 8^s{\cdot}20$.

27 B.Z. 348 ; $5^h\ 34^m\ 35^s{\cdot}74$, and $5^h\ 34^m\ 46^s{\cdot}34$.

28 Same stars.

30 B.Z. 348 ; $5^h\ 37^m\ 26^s{\cdot}60$, and $5^h\ 37^m\ 22^s{\cdot}30$.

31 — — $5^h\ 37^m\ 26^s{\cdot}60$. Two comparisons. Very low, and very faint. Lost in cloud after two comparisons.

April 8 H. C. 11589. Near the moon. Very faint. Cannot depend on this observation.

10 B.Z. 348; $6^h\ 2^m\ 55^s{\cdot}40$, and $6^h\ 2^m\ 55^s{\cdot}99$. Five comparisons. Strong moonlight. Light clouds. Planet faint.

13 B.A.C. 2011, B.Z. 348, $6^h\ 4^m\ 36^s{\cdot}30$. Eight comparisons.

24 B.Z. 348 ; $6^h\ 27^m\ 4^s{\cdot}16$. The star and planet were unfavourably posited for comparison.

25 Same star. Five comparisons. Interrupted by clouds.

26 B.Z. 348 ; $6^h\ 33^m\ 0^s{\cdot}79$

29 — — 6 36 45 ·93

When not otherwise mentioned in the notes ten comparisons were made in each observation.

ASTRÆA.

South Villa. Equatoreal. (MM. Bishop and Hind.)

1848.	G.M.T. h m s	R.A. ° ′ ″	Decl. ° ′ ″
June 29	12 47 13	328 56 5·1 − 0·402 *p*	−11 27 35·2 + 0·861 *p*
30	12 18 43	328 52 36·2 − 0·452 *p*	−11 29 47·7 + 0·853 *p*

"An ephemeris will appear in the *Berliner Jahrbuch* for 1851. The planet has just become visible in the morning, and we have with great difficulty obtained the following observations. The planet is not brighter than a star of the 12th magnitude.

"It is hoped that an ephemeris of *Hebe* will be ready before she can be observed.

IRIS.

Ephemeris at her Reappearance, 1848. By Mr. Hind.

"The following ephemeris of this planet up to November 11, is founded upon elements calculated from the observations at Mr. Bishop's Observatory on August 13, 1847; Dr. Wichmann's with the Königsberg Heliometer, on November 7; and Professor Challis' latest observation, 1848, February 17. The observed positions were corrected for aberration and parallax; but the effect of planetary perturbations on the geocentric place during the interval, being very minute, has been neglected.

Epoch 1847, August 1·0, Greenwich Mean Time.

Mean Longitude of *Iris*	331	24	20·57	}	M.E. Aug. 1.
ϖ	41	31	19·71		
Ω	259	44	45·91		
i	5	28	15·26		
φ	13	19	59·98		
Log a			0·3772589		
μ			964″·091333		

"These elements represent the middle declination exactly, and give the right ascension too small by 0″·8. On comparing them with the latest observation which I have yet seen, viz. Professor Kaiser's on March 14, (published in a recent number of the Society's *Monthly Notices*), I find the following errors:—

$$\text{Cos.}\,\delta \times \Delta\alpha = -2''\cdot37 \qquad \Delta\delta = -5''\cdot11$$

"These differences being so very small, it appeared to me probable that any attempt to correct the orbit from a combination of the observations during the first apparition of *Iris* only, would hardly repay the trouble that must necessarily be expended upon it. I have therefore delayed the final investigation until after the next appearance of the planet. The two oppositions can then be connected, and the elements resulting from a discussion of all the observations will no doubt be sufficiently exact to form the basis for ephemerides for some time to come.

"Assuming, therefore, that the orbit just given applies to Greenwich mean noon of 1847, August 1, I have calculated the perturbations produced by *Venus*, the *Earth*, *Mars*, *Jupiter*, and *Saturn*, between this date and 1849, February 3, (nearly the epoch of opposition), employing the same values for the masses as are now adopted by Encke in his investigations on the comet which bears his name; their logarithms are,—

Venus	4·39595
Earth and Moon	4·44916
Mars	3·5718
Jupiter	6·97969
Saturn	6·45573

" The united effects of these planets, between 1847, August 1, and 1849, February 3, are,—

$$\int d\alpha = +0''.00053771$$
$$\int de = +0''.000302365$$
$$\int d\pi = +\ 295''.282$$
$$\int dL = +\ 146\ .486$$
$$\int d\Omega = -\ 76\ .789$$
$$\int di = -\ 7\ .232$$

" For the ephemeris subjoined the true elements were obtained for every 24th day, and interpolated with 4th differences, where sensible, for every 8th day. The geocentric places so obtained were interpolated with 4th differences for each day. For the sake of brevity the elements of the variable ellipse are here given for the extreme dates of the ephemeris only :—

	Aug. $7^{d}\cdot0$	Nov. $11^{d}\cdot0$
	° ′ ″	° ′ ″
M	29 28 26·64	55 9 7·09
π	41 35 29·24	41 36 55·13
Ω	259 45 41·02	259 45 51·44
i	5 28 14·30	5 28 11·39
φ	13 20 0·25	13 20 33·03
Log. μ	2·9841593	2·9840273

" The longitudes are referred to the apparent equinox of date; corrections being applied for diminution of obliquity, &c. The ephemeris contains the position of the planet, for the apparent equinox and equator of each date, unaffected with aberration; consequently, before comparing with apparent places, it will be necessary to subtract the time given in the last column from the mean time of observation.

Ephemeris.

At Greenwich Mean Noon.

1848.	R.A.	Decl.	Log. Δ	497″·8 × Δ
	° ′ ″	° ′ ″		m s
August 7	104 51 34·7	+22 11 17·8	0·43794	22 44·6
8	105 27 11·3	22 6 11·3		
9	106 2 40·5	22 0 57·2	0·43679	22 40·9
10	106 38 2·0	21 55 35·4		
11	107 13 15·9	21 50 6·3	0·43560	22 37·2
12	107 48 22·0	21 44 29·7		
13	108 23 20·2	21 38 45·9	0·43437	22 33·4
14	108 58 10·5	21 32 54·8		
15	109 32 52·8	21 26 56·7	0·43310	22 29·4
16	110 7 27·2	21 20 51·6		
17	110 41 53·3	21 14 39·6	0·43178	22 25·3
18	111 16 11·4	+21 8 20·8		

1848.		R.A.	Decl.	Log. Δ	497″·8 × Δ
		h m s	° ′ ″		m s
August	19	7 34 21·0	+21 1 55·4	0·43042	22 21·1
	20	7 36 24·3	20 55 23·3		
	21	7 38 15·1	20 48 44·8	0·42900	22 16·7
	22	7 40 59·3	20 41 59·8		
	23	7 43 35·0	20 35 8·6	0·42755	22 12·3
	24	7 46 2·0	20 28 11·1		
	25	7 48 20·2	20 21 7·4	0·42604	22 7·7
	26	7 50 29·6	20 13 57·8		
	27	7 52 29·9	20 6 42·2	0·42448	22 2·9
	28	7 54 21·2	19 59 20·9		
	29	7 56 3·2	19 51 53·9	0·42288	21 58·0
	30	7 57 36·1	19 44 21·3		
	31	7 58 59·6	19 36 43·3	0·42122	21 53·0
Sept.	1	8 0 13·7	19 28 59·9		
	2	8 1 18·2	19 21 11·3	0·41951	21 47·9
	3	8 2 13·2	19 13 17·6		
	4	8 3 58·5	19 5 18·8	0·41775	21 42·6
	5	8 5 34·3	18 57 15·0		
	6	8 7 0·3	18 49 6·5	0·41594	21 37·2
	7	8 8 16·6	18 40 53·2		
	8	8 9 23·1	18 32 35·3	0·41407	21 31·6
	9	8 10 19·7	18 24 12·9		
	10	8 11 6·5	18 15 46·1	0·41215	21 25·6
	11	8 11 43·4	18 7 15·0		
	12	8 12 10·3	17 58 39·7	0·41017	21 20·0
	13	8 12 27·2	17 50 0·3		
	14	8 12 34·0	17 41 17·0	0·40814	21 14·0
	15	8 12 30·8	17 32 29·7		
	16	8 12 17·4	17 23 38·7	0·40605	21 7·9
	17	8 11 54·0	17 14 44·0		
	18	8 11 20·3	17 5 45·7	0·40390	21 1·7
	19	8 10 36·3	16 56 44·0		
	20	8 9 41·8	16 47 38·9	0·40170	20 55·3
	21	8 8 36·8	16 38 30·7		
	22	8 7 21·2	16 29 19·4	0·39944	20 48·8
	23	8 5 55·0	16 20 5·2		
	24	8 4 17·9	16 10 48·0	0·39712	20 42·1
	25	8 2 30·1	16 1 28·1		
	26	8 0 31·2	15 52 5·5	0·39473	20 35·3
	27	7 58 21·3	15 42 40·3		
	28	7 56 0·2	15 33 12·8	0·39229	20 28·4
	29	7 53 28·3	15 24 42·9		
	30	7 50 44·9	15 14 10·9	0·38978	20 21·3
Oct.	1	7 47 50·2	+15 4 36·9		

1848.	R.A.	Decl.	Log. Δ	497″·8 × Δ
	h m s	° ′ ″		m s
Oct. 2	134 17 44·0	+14 55 0·9	0·38720	20 14·1
3	134 44 26·3	14 45 23·2		
4	135 10 56·9	14 35 43·7	0·38456	20 6·7
5	135 37 16·0	14 26 2·6		
6	136 3 23·2	14 16 20·1	0·38187	19 59·7
7	136 29 18·8	14 6 36·1		
8	136 55 2·6	13 56 50·9	0·37910	19 51·7
9	137 20 34·5	13 47 4·5		
10	137 45 54·4	13 37 17·0	0·37628	19 43·9
11	138 11 2·4	13 27 28·5		
12	138 35 58·3	13 17 39·2	0·37339	19 36·1
13	139 0 42·1	13 7 49·2		
14	139 25 13·6	12 57 58·6	0·37044	19 28·1
15	139 49 32·8	12 48 7·5		
16	140 13 39·5	12 38 16·1	0·36741	19 20·0
17	141 37 33·6	12 28 24·4		
18	141 1 15·0	12 18 32·5	0·36432	19 11·8
19	141 24 43·6	12 8 40·5		
20	141 47 59·4	11 58 48·6	0·36117	19 3·5
21	142 11 2·0	11 48 56·9		
22	142 33 51·4	11 39 5·5	0·35795	18 55·0
23	142 56 27·4	11 29 14·7		
24	143 18 50·0	11 19 24·3	0·35465	18 46·4
25	143 40 58·9	11 9 34·9		
26	144 2 54·0	10 59 46·1	0·35129	18 37·7
27	144 24 35·1	10 49 58·4		
28	144 46 2·0	10 40 11·8	0·34785	18 28·9
29	145 7 14·6	10 30 26·5		
30	145 28 12·7	10 20 42·5	0·34436	18 20·0
31	145 48 56·3	10 11 0·0		
Nov. 1	146 9 25·1	10 1 19·2	0·34079	18 11·0
2	146 29 39·1	9 51 40·1		
3	146 49 38·1	9 42 2·8	0·33716	18 2·0
4	147 9 22·0	9 32 27·5		
5	147 28 50·5	9 22 54·2	0·33346	18 52·8
6	147 48 3·7	9 13 23·2		
7	148 7 1·3	9 3 54·5	0·32970	17 43·6
8	148 25 43·2	8 54 28·4		
9	148 44 9·2	8 45 4·9	0·32587	17 34·2
10	149 2 19·2	8 35 44·3		
11	149 20 13·1	+8 26 26·4	0·32197	17 24·8

NEPTUNE.

Observations.

CAMBRIDGE. On the Meridian. (Prof. Challis.)

1848.	Greenwich M.T.	R.A.	Obsd.—Cald.	N.P.D.	Obsd.—Cald.
	h m s	h m s	s	° ′ ″	″
July 12	14 52 57·0	22 17 48·37	−0·93	101 17 47·9	+4·3
13	48 56·8	17 44·04	−1·01	101 18 14·8	+5·5
15	14 40 56·3	22 17 35·30	−0·99		

"The observations are compared with Mr. Adams's Ephemeris, and parallax is taken into account.

HAMBURG. Equatoreal. (M. Rümker.)

1848.	Hamburg M.T.	R.A.	N.P.D.
	h m s	h m s	° ′ ″
July 4	12 44 53·0	22 18 19·92	101 14 43·1
6	12 25 51·0	22 18 12·95	101 15 29·3

Ephemeris for Greenwich Mean Midnight. By Mr. Adams.

1848.	R.A.	N.P.D.	1848.	R.A.	N.P.D.
	h m s	° ′ ″		h m s	° ′ ″
July 1	22 18 30·41	101 13 31·3	July 26	22 16 42·92	101 24 19·9
2	27·22	51·2	27	37·59	51·3
3	23·92	14 11·7	28	32·20	25 23·1
4	20·52	32·8	29	26·75	55·2
5	17·02	54·4	30	21·24	26 27·6
6	13·42	15 16·5	31	15·68	27 0·2
7	9·72	39·2	Aug. 1	10·06	33·1
8	5·92	16 2·5	2	16 4·39	28 6·3
9	18 2·03	26·2	3	15 58·67	39·8
10	17 58·05	50·5	4	52·90	29 13·4
11	53·97	17 15·2	5	47·08	29 47·3
12	49·81	40·5	6	41·22	30 21·5
13	45·56	18 6·2	7	35·32	55·8
14	41·21	32·4	8	29·38	31 30·3
15	36·79	59·0	9	23·41	32 5·0
16	32·28	19 26·1	10	17·40	39·8
17	27·69	53·7	11	11·36	33 14·8
18	23·02	20 21·6	12	15 5·28	49·9
19	18·27	50·0	13	14 59·18	34 25·1
20	13·44	21 18·9	14	53·06	35 0·4
21	8·53	48·1	15	46·91	35 35·9
22	17 3·55	22 17·7	16	40·74	36 11·4
23	16 58·50	47·7	17	34·56	47·0
24	53·37	23 18·1	18	28·36	37 22·6
25	22 16 48·18	101 23 48·8	19	22 14 22·14	101 37 58·3

1848.	R.A. h m s	N.P.D. ° ′ ″
Aug. 20	22 14 15·91	101 38 34·0
21	9·66	39 9·7
22	14 3·42	45·5
23	13 57·16	40 21·2
24	50·91	56·9
25	44·65	41 32·6
26	38·39	42 8·2
27	32·14	43·8
28	25·89	43 19·4
29	19·66	54·8
30	13·44	44 30·1
31	7·23	45 5·3
Sept. 1	13 1·05	40·3
2	12 54·88	46 15·2
3	48·73	49·9
4	42·62	47 24·4
5	36·52	58·8
6	30·46	48 33·0
7	24·43	49 6·9
8	18·43	40·6
9	12·47	50 14·1
10	6·55	47·3
11	12 0·67	51 20·3
12	11 54·83	53·0
13	49·04	52 25·4
14	43·29	57·5
15	37·59	53 29·3
16	31·95	54 0·8
17	26·36	32·0
18	20·83	55 2·8
19	15·35	33·2
20	9·94	56 3·3
21	11 4·59	33·0
22	10 59·30	57 2·2
23	54·09	31·1
24	48·94	59·6
25	43·86	58 27·7
26	38·85	55·3
27	33·92	59 22·5
28	29·07	101 59 49·2
29	24·30	102 0 15·4
30	19·62	41·1
Oct. 1	15·02	1 6·4
2	22 10 10·50	102 1 31·1

1848.	R.A. h m s	N.P.D. ° ′ ″
Oct. 3	22 10 6·07	102 1 55·4
4	10 1·73	2 19·1
5	9 57·49	42·2
6	53·34	3 4·8
7	49·28	26·9
8	45·32	48·5
9	41·45	4 9·4
10	37·69	29·8
11	34·02	49·6
12	30·46	5 8·9
13	27·00	27·5
14	23·65	45·5
15	20·40	6 3·0
16	17·26	19·8
17	14·23	36·0
18	11·32	51·5
19	8·51	7 6·4
20	5·82	20·7
21	3·25	34·3
22	9 0·79	47·3
23	8 58·44	59·6
24	56·22	8 11·2
25	54·12	22·2
26	52·13	32·5
27	50·27	42·1
28	48·53	51·0
29	46·91	59·2
30	45·42	9 6·7
31	44·06	13·5
Nov. 1	42·82	19·6
2	41·71	25·0
3	40·72	29·7
4	39·87	33·7
5	39·14	36·9
6	38·55	39·5
7	38·08	41·3
8	37·74	42·4
9	37·53	42·8
10	37·45	42·4
11	37·50	41·4
12	37·68	39·6
13	37·99	37·0
14	38·44	33·8
15	22 8 39·01	102 9 29·9

1848.	R.A. h m s	N.P.D. ° ′ ″	1848.	R.A. h m s	N.P.D. ° ′ ″
Nov.16	22 8 39·71	102 9 25·2	Nov.24	22 8 50·12	101 8 21·4
17	40·55	19·8	25	52·02	8 10·1
18	41·52	13·6	26	54·04	7 58·2
19	42·63	6·7	27	56·20	45·5
20	43·86	8 59·1	28	8 58·49	32·1
21	45·23	50·8	29	9 0·90	18·0
22	46·73	41·7	30	22 9 3·45	102 7 3·1
23	22 8 48·36	102 8 31·9			

Horizontal Parallax.

July 1, 0″·29; Sept. 1, 0″·30; Nov. 1, 0″·29.

METIS.

Observations.

MARKREE. Meridian Circle. (E. J. Cooper, Esq. & Mr. Graham.)

Greenwich M.T. 1848.	R.A. h m s	Decl. ° ′ ″	Obsr.	Obsn.—Ephems. s ″
April 26·547714	14 55 29·94	−12 31 33·1	A.G.	−0·14 +0·5
May 5·516892	46 28·56	12 7 33·0	,,	−0·11 +0·5
9·503206	42 29·15	11 57 35·9	,,	0·00 −0·1
10·499796	41 30·31	55 14·8	,,	+0·12 −1·4
12·492931	39 33·80	50 38·2	,,	−0·01 +0·5
13·489599	38 36·48	48 26·7	,,	−0·04 0·0
16·479386	35 48·93	42 17·0	,,	+0·06 −0·9
19·469431	33 8·59	36 47·0	,,	−0·11 −0·7
22·459488	30 36·86	32 3·4	,,	−0·44 −0·6
26·446062	27 30·60::	27 6·0	E.J.C.	−0·51 −2·1
29·436763	25 23·90	24 25·7	,,	−0·66 −1·2
June 2·424054	14 22 54·15	−11 22 23·7	,,	−0·91 +1·6

May 5. Very faint. Did not appear larger than a 10th mag. star.
9. Very faint.
10. Excessively faint.
13. Do.
16. Very difficult. Near the moon. Got only three wires. Corrected an error of 2s in the third wire.
19. Well shewn, and well taken.
22. Faint.
26. Seen with extreme difficulty. Got but two wires. The second of these seems to have been an illusion, and was rejected.
29. Extremely faint. Got the whole seven wires; but as the centre wire was marked "very doubtful" in the observing book, and differs 1s from the mean, it was omitted in the reduction.

June 2. Extremely faint.

With the large Equatoreal, Square-bar Micrometer.

Greenwich M.T. 1848.	R.A. h m s	Decl. ° ′ ″	Obsr.	Obsn. — Ephems. R.A. s	Decl. ″
April 26·472888	14 55 34·58	−12 31 46·3	A.G.	+0·08	− 0·6
26·596244	27·26	26·9	,,	−0·06	− 1·2
28·441448	53 37·48	26 31·6	,,	+0·25	− 6·5
29·451017	52 36·77	23 50·0	,,	+0·24	− 9·0
May 3·407148	48 36·84	13 8·0	,,	+0·10	− 3·5
5·440066	46 33·30	12 7 47·3	,,	−0·01	− 1·8
12·451285	39 36·48	11 50 52·9	,,	+0·26	− 8·5
13·440015	38 39·33	48 37·0	,,	−0·01	− 3·6
*18·448766	34 2·12	38 33·5	,,	−0·33	+ 0·4
*19·436960	33 10·42	36 48·1	,,	+0·03	+ 1·5
25·499828	28 13·08	27 53·8	,,	−0·48	+12·4
29·495979	25 21·69	24 28·5	,,	−0·49	− 6·6
29·504334	21·63	34·5	E.J.C.	−0·21	−12·9
June 2·467104	22 53·27	22 40·3	,,	−0·30	−15·6
3·461207	22 19·34	22 25·4	,,	−0·62	−13·1
5·479031	21 15·37	22 21·7	,,	−0·91	−14·9
5·489616	15·25	20·7	A.G.	−0·72	−13·9
15·516338	17 32·00	29 19·2	,,	−1·45	−10·2
19·522799	16 47·11	35 37·6	E.J.C.	−1·47	−19·9
20·458465	16 40·00	37 17·7	,,	−1·68	−17·8
28·469008	14 16 35·39	−11 55 34·7	,,	−2·14	+ 1·5

These are corrected for Parallax.

Stars of Comparison and Notes.

1848.
April 26. Bessel xiv. 1066, H. C. 27376. Planet 10th mag.
28. — — 1031, Interrupted by clouds.
29. — — 1031.
May 3. — — 956, H. C. 27247. I used for Lalande's R.A. $47^s·38$, instead of what is given in the British Catalogue. A mistake of $2^s·5$ which occurred in the reduction, as formerly published, is here corrected.—See Astron. Society's *Notices*, p. 149. The planet was faint when we commenced, twilight being too strong. I fancied the planet to-night 9½ magnitude. Interrupted by clouds.
5. — — 846, 956, H. C. 27211.
12. — — 697, 735. I was struck with a faint point a little below *Metis*, about the same R.A.
13. — — 697, 735. Strong moonlight and flying clouds made the observation very difficult.
18. — — 622, 625. The planet appeared to me quite as bright as the former of these two stars, which Bessel makes 9th magnitude.
19. — — 622, 625. The latter of these two stars is 4848 of the B.A. Catal., where there is decidedly an error of 4^s in the R.A. A subsequent observation with the meridian circle, on May 25th, gives for the mean place 1848·0, $14^h\ 33^m\ 48^s·05$, 101° 34′ 53″·8: thence the correction of the catalogue would be $-3^s·95$ +0″·78. Adopting this place of 625, we obtain for the planet,

May 18	$14^h\ 34^m\ 2^s·32$	−11° 38′ 41″·7
19	33 10·61	36 56 ·3

1848.
May 25. B.A.C. 4828. Having been apprehensive of an error in the place of this star, I observed it thrice with the meridian circle, and adopted the place thus obtained. There is very little difference, however.
B. A. C. gives $14^h\ 28^m\ 13^s{\cdot}20$ $-11^\circ\ 27'\ 56''{\cdot}6$
Rümker 12 ·91 58 ·8
Markree obs. (as above) 13 ·02 58 ·4

29. Bessel xiv. 424. H. C. 26484. Five comparisons each observer.
June 2. — — — Planet faint. Milky atmosphere.
5. — — — Five comparisons each observer. Planet very fairly shewn.
15. — — 259. H. C. 26265. The planet was so excessively faint in the strong moonlight, that no dependence can be placed in the observation. Took seven comparisons. There is a typographical error in Weisse, xiv, 296, the declination, should be $-10^\circ\ 11'\ 0''{\cdot}0$ instead of $-11^\circ\ 11'\ 0''{\cdot}0$.
19. — — 259. Nine comparisons.
20. — — 259. Satisfactory observation, though planet rather faint.
28. — — 278. Only two comparisons, and these very uncertain.

There have always been ten comparisons made in each observation, unless when the contrary is expressly mentioned.

CAMBRIDGE. On the Meridian. (Prof. Challis.)

1848.	Greenwich M.T. h m s	R.A. h m s	No. of Wires.	N.P.D. ° ′ ″
April 30	12 14 55·6	14 51 32·35	5	102 20 46·6
May 1	9 59·8	50 32·36	7	18 2·5
2	5 3·2	49 31·51	3	15 25·3
3	12 0 6·8	.....	...	12 47·1
4	11 55 10·6	47 30·40	7	10 10·4
5	50 15·0	46 30·50	5	7 32·6
6	45 18·6	45 29·80	4	5 2·8
7	40 22·7	44 29·72	7	102 2 31·4
8	35 27·0	43 29·76	6	101 59 55·2
9	30 31·9	42 30·38	6	57 34·9
10	25 37·2	41 31·40	5	55 16·4
11	20 43·0	.....	...	52 59·7
12	15 49·2	.....	...	50 40·1
13	10 56·1	38 37·56	7	48 23·7
15	11 1 11·5	.....	...	44 3·8
18	10 46 41·3	.....	...	38 28·9
22	27 34·6	.....	...	32 7·8
23	22 50·5	29 49·60	6	30 25·4
27	10 4 5·3	26 47·59	6	26 1·7
30	9 50 15·5	24 45·21	4	.....
31	45 41·7	24 7·23	5	101 23 12·1
June 5	23 14·3	21 18·91	3	.....
6	9 18 47·6	14 20 48·00	3	.....

With the Northumberland Equatoreal.

1848.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″	No. of Comp.	Refer. Star.
April 30	11 5 31·2	14 51 35·28	102 20 52·4	12	*a*
May 1	11 23 9·7	50 33·87	18 10·3	7	*b*
2	12 42 39·1	49 29·76	15 25·4	6	*a*
3	11 31 57·5	48 32·11	12 52·8	6	*a*
4	12 49 14·6	47 28·35	10 8·4	6	*b*
6	13 14 1·9	45 26·00	102 4 46·6	6	*c*
12	12 17 40·6	39 32·80	101 50 37·6	6	*d*
15	12 13 31·2	36 42·50	44 15·3	6	*d*
16	12 4 22·1	33 47·46	42 12·2	6	*e*
24	13 13 2·3	28 56·96	29 13·5	7	*f*
30	11 17 5·6	24 42·79	23 40·5	6	*g*
June 5	10 53 44·8	21 15·75	22 8·0	6	*h*
6	10 39 4·8	14 20 46·84	101 22 14·1	5	*h*

"The above observations and those on the meridian are all corrected for parallax by means of Mr. Luther's Ephemeris in the *Astronomische Nachrichten*, No. 640. The following are the adopted mean places of the reference stars, determined by meridian observations:—

	Star.		Mean R.A. 1848,0. h m s	Mean N.P.D. 1848,0. ° ′ ″
(*a*)	Bessel xiv.	956	14 50 24·13	102 9 17·8
(*b*)	—	931	49 19·39	102 1 19·3
(*c*)	—	896	47 28·50	102 35 9·6
(*d*)	—	697	37 29·67	101 42 31·0
(*e*)	B.A.C.	4848	33 47·95	101 34 52·6
(*f*)	Bessel xiv.	523	28 30·93	100 58 38·9
(*g*)	—	498	27 11·49	101 4 37·3
(*h*)	—	424	14 23 6·94	101 11 26·1

The seconds of the R.A. of the star (*e*) in the British Association Catalogue should be 54·56 instead of 58·56.

HAMBURG. Merid. Circle & Transit. (MM. C. & G. Rümker.)

1848.	Hamburg M.T. h m s	R.A. Mer. Circle. h m s	R.A. Transit. s	N.P.D. ° ′ ″
May 5	11 50 46·1	14 46 31·64	31·39	102 7 47·5
6	45 50·1	45 31·35	31·35	5 16·9
7	40 54·2	44 31·22	31·06	2 45·7
8	35 58·9	43 31·64		102 0 18·9
9	31 3·5	42 32·03	31·89	101 57 52·4
10	26 9·1	41 33·29	33·60	55 29·2
11	21 14·8	40 34·77		53 6·9
12	16 21·3	39 37·03		50 55·0
13	11 11 27·7	14 38 39·15	39·31	101 48 39·6

1848.	Hamburg M.T. h m s	R.A. Mer. Circle. h m s	N.P.D. ° ′ ″
May 14	11 6 35·2	14 37 42·46	101 46 26·6
21	10 32 51·1	31 28·90	33 41·4
22	28 5·0	30 39·36	32 13·0
23	23 21·7	29 50·86	30 54·0
24	18 39·0	29 3·94	29 32·6
26	9 16·4	27 32·75	27 5·7
27	10 4 36·9	26 49·18	26 15·2
30	9 50 46·7	24 46·33	23 51·7
June 1	9 41 40·0	14 23 31·31	101 22 46·5

With the Equatoreal.

June 1	10 52 4·4	14 23 29·66	101 22 46·0
3	11 13 37·9	14 22 20·15	101 22 17·6

Elements.

By Dr. Brunnow of the Bilk Observatory.

M	147° 20′ 27″·9.	1848, May 12. Berlin M.T.
ϖ	68 34 21·5	Mean Equinox.
Ω	66 35 47·8	1848, Jan. 1.
i	6 10 7·6	
φ	10 6 49·5	
μ	961″·2567	

From Observations of April 26, South Villa.
,, May 5, Hamburg.
,, May 11, Bilk.

By Dr. B. A. Gould.

M	142° 51′ 34″·9.	1848, May 0. Berlin M.T.
ϖ	72 12 3·7	
Ω	68 35 3·0	
i	5 33 55·9	
φ	7 3 32·9	
μ	962″·9598	Period 1345^{d}·85

Ephemeris at Greenwich Mean Noon. By Mr. Graham.

1848.	R.A. h m s	N.P.D. ° ′ ″	Log. Δ
July 11	14 19 39·72	102 38 8·6	0·33934
12	20 3·51	42 9·8	34190
13	20 28·58	46 16·0	34446
14	20 54·93	50 27·1	34702
15	21 22·53	54 43·1	34957
16	14 21 51·37	102 59 3·7	0·35211

1848.	R.A. h m s	N.P.D. ° ′ ″	Log. Δ
July 17	14 22 21·43	103 3 29·0	0·35464
18	22 52·70	7 58·8	35717
19	23 25·17	12 33·0	35969
20	23 58·82	17 11·5	36220
21	24 33·63	21 54·1	36471
22	25 9·60	26 40·8	36720
23	25 46·72	31 31·6	36969
24	26 24·96	36 26·3	37216
25	27 4·32	41 24·9	37463
26	27 44·78	46 27·2	37708
27	28 26·33	51 33·1	37953
28	29 8·97	103 56 42·6	38196
29	29 52·68	104 1 55·5	38438
30	30 37·44	7 11·7	38679
31	31 23·24	12 31·2	38919
August 1	32 10·07	17 53·9	39157
2	32 57·91	23 19·6	39394
3	33 46·76	28 48·2	39630
4	34 36·59	34 19·7	39864
5	35 27·39	39 53·9	40097
6	36 19·15	43 30·8	40329
7	37 11·87	51 10·1	40559
8	14 38 5·52	104 56 51·9	0·40788

ENCKE'S COMET. By Mr. Hind.

"An ephemeris for the reappearance of Encke's Comet during the ensuing autumn has been published in the *Astronomische Nachrichten* by Prof. Encke.

"At the last return of the comet to perihelion, in 1842, only four observations were obtained; two at Rome by Prof. De Vico, on July 9 and 14; one at Philadelphia by Mr. Walker, on July 4; and one at Washington, on July 14, by Prof. Coffin. Encke finds for the mean error of the ephemeris in that year,

July $10^{d}\cdot6$ R.A. $-37''\cdot5$ δ $+7''\cdot0$

"The elements for 1848, given by Encke, are those resulting from his last discussion in Nos. 488 and 489 of the *Astronomische Nachrichten*, brought up to the next perihelion passage by the application of planetary perturbations and the effect of a resisting medium. The fundamental elements depend on all the observations made in the years 1818, 1825, 1828, 1835, and 1838, the mass of the planet *Mercury* having been corrected by the observations of 1838. In 1835, on the 23d of August, the comet approached that planet within 0·12 of the earth's mean distance; but it appears that a much closer appulse will take place about midnight on the 22d

of November next, when the distance between the two bodies will not exceed 0·038; consequently, the observations of 1852 and subsequently will afford the means of determining the mass of *Mercury* with very considerable accuracy.

"The elements for 1848 are,—

Epoch 1848, Nov. 26·125, Mean Paris Time.

Mean Anomaly	° ′ ″ 0 0 3·046	
μ	1076″·46749	
ϕ	° ′ ″ 57 58 34·38	
ϖ	157 47 7·78	Mean Equinox,
Ω	334 22 11·53	1848, Nov. 26.
i	13 8 35·84	

"An ephemeris has been calculated from these elements by M. d'Arrest with every regard to accuracy; it extends from September 0 to November 27. An abstract of this ephemeris for September is here given, but in a somewhat different form to that adopted by M. d'Arrest. The epoch is 15^h mean time at Greenwich, and the positions are reckoned from true equinox of date, but are not affected with aberration.

1848.	True R.A. h m s	True N.P.D. ° ′ ″	Hor. Par. ″	Time for Aberr. m s
Sept. 0	3 27 31·66	56 45 14·5	7·67	9 12
2	32 11·23	56 0 58·9	7·97	8 51
4	37 5·55	55 14 42·3	8·30	8 30
6	42 16·96	54 26 13·2	8·64	8 10
8	47 48·28	53 35 20·5	9·01	7 50
10	3 53 42·58	52 41 53·1	9·42	7 30
12	4 0 3·94	51 45 37·4	9·83	7 10
14	6 57·26	50 46 21·0	10·31	6 51
16	14 27·91	49 43 52·9	10·82	6 31
18	22 43·36	48 38 3·0	11·37	6 13
20	31 52·28	47 28 45·7	11·96	5 54
22	42 5·56	46 16 0·3	12·60	5 36
24	4 53 36·58	45 0 5·1	13·29	5 19
26	5 6 42·03	43 41 25·2	14·05	5 1
28	21 42·27	42 21 1·6	14·85	4 45
30	5 39 1·63	41 0 36·1	15·72	4 29

The intensity of light, supposed to be represented by $\frac{1}{r^2 \Delta^2}$, will be

Sept. 0	0·30
14	0·68
28	1·90
Oct. 12	5·85
26	9·86
Nov. 9	9·17
23	8·77

Expected Comet of 1264 *and* 1556.

For information respecting this comet, and for ephemerides on the hypothesis of different times of perihelion passage, see Mr. Hind's pamphlet, *On the expected Return of the Great Comet of* 1264 *and* 1556, by J. R. Hind, 8vo. pp. 78. London, G. Hoby, 123 Mount Street, Berkeley Square.

Parabolic Elements of the First Comet of 1847. By Mr. Pogson.

The following orbit is calculated upon the observation at Mr. Bishop's observatory on February 7th, the daylight positions obtained at the same observatory on March 30, and the Berlin observation of April 24; thus embracing the whole period of visibility. The elements of this comet appear to differ sensibly from a parabola:—

T 1847, March 30·27725, Greenwich Mean Time.

π	276 2 43·7	Mean Equinox, 1847·0
Ω	21 42 45·3	
i	48 39 33·6	
Log. q	8·628571	

Motion direct.

Corrections of the Elements of the Moon's Orbit, deduced from the Lunar Observations made at the Royal Observatory of Greenwich, from 1750 *to* 1830. By G. B. Airy, Esq., Astronomer Royal.*

"The reductions of the Greenwich Lunar Observations, lately published by the Lords Commissioners of the Admiralty, present the results of a series of observations, to which scarcely any thing similar exists, and to which nothing similar can be furnished for many years to come. The whole number of observations of right ascen-

* The title of the work referred to in Mr. Airy's Memoir is *Reduction of the Observations of the Moon, made at the Royal Observatory, Greenwich, from* 1750 *to* 1830. *Computed by order of the Lords Commissioners of the Treasury, under the superintendence of G. B. Airy, Esq., M.A., Astronomer Royal. Published by order of the Lords Commissioners of the Admiralty.* London, 1848. 2 vols. 4to.

The Lords of the Admiralty, with their wonted liberality, have placed a large number of copies of this important work at the disposal of the Royal and of the Royal Astronomical Societies. It is understood that they will be presented to those public bodies and scientific gentlemen to whom the Greenwich Observations are given. As there is a difficulty in transmitting such articles, it is requested that application should be made for them at the apartments of the Society, or at least that information should be given as to the most convenient channel. It is proper to mention here, what might otherwise probably be unnoticed, that the Reduction of the Greenwich Lunar Observations is due to the suggestion of the Astronomer Royal himself, and that his direction and superintendence have been gratuitous. This was also the case with the Greenwich Planetary Reductions, published two or three years ago.

sion of the moon which are thoroughly reduced is 9067. Of these 674 are not accompanied by trustworthy observations in north polar distance (the observations being sometimes wanting, sometimes inaccurate in character, as in the method of observation called *per segmentum*, and sometimes vitiated by the faults of adjustment of the quadrant): leaving 8393 observations, complete in both elements, and as good as the nature of the instruments permitted. All these observations are used in the investigations which form the subject of this paper. These observations have been reduced with a labour proportionate to their importance. Much care has been used in planning the form of the reductions, and no pains have been spared in insuring their accuracy in every detail. The results are exhibited in a form which makes it comparatively easy for any person occupied with empirical reductions from observations to investigate the co-efficient of any inequality of any periodic time whatever. I trust, therefore, that the utility of these reductions will not be limited to the investigation of the corrections which I now beg leave to lay before the Royal Astronomical Society.

"The deductions from the reduced observations which have the first claim on our attention are, evidently, the corrections of those elements which enter as arbitrary constants in the mechanical theory of the moon's motion, and the corrections of the most important results of theory, on which, from the slowness of convergence of series, or from the practical difficulty of picking up every sensible term, some doubt may yet exist. The former are, the moon's epoch of longitude and mean motion, the excentricity and epoch of anomaly, and the inclination and epoch of argument of latitude. The latter are, the motion of anomaly (depending on the progression of the apse), the motion of argument of latitude (depending on the regression of the node), the variation, the evection, and the annual equation. But there are also other terms which demand particular attention, as depending upon other elements which are not of an arbitrary character, though their values are not precisely known. These are the equations of long period in the longitude and in the elements of latitude of the moon (depending on the ellipticity and internal constitution of the earth), the parallactic equation (depending on the proportion of the moon's mean distance to the sun's mean distance), and the constant term of the moon's parallax (depending in part on the proportion of the moon's mass to the earth's mass). All these terms are clearly pointed out by the nature of the case as demanding our first attention in the discussion of the reduced observations.

"In preparing the last section of the printed work, the importance of these deductions was kept in view. Through every part of the tabular exhibition of the comparison of observed and theoretical places of the moon, there are exhibited the corresponding values of the principal inequalities affecting the moon's place in every observation, each increased by a constant for the purpose of making it always positive. In the comparison of observed and theoretic longitudes the quantities thus exhibited are, (1), The Elliptic Inc-

quality; (2), Its change for a change of $0^{g}\cdot1$ ($\frac{1}{4000}$ part of the circumference) in argument; (3), The Parallactic Inequality; (4), The Variation; (5), Its change for a change of $0^{g}\cdot1$ in argument; (6), The Annual Equation; (7), The Evection; and (8), Its change for a change of $0^{g}\cdot1$ in argument. Of these, the 5th is necessary only in case the correction of moon's longitude should be very large; and the 8th is necessary only in combination with the 2d, as the argument of evection is necessarily dependent on the argument of elliptic inequality. In the comparison of observed and theoretical ecliptic north polar distance, the quantities exhibited are (9), The Effect of mean Inclination; (10), Its change for a change of $0^{g}\cdot1$ in argument; (11), The Evection in Ecliptic North Polar Distance. The equations of long period in the longitude and in the elements of latitude are not exhibited, because the corrections of those equations can be deduced by a simple process from the corrections of the other quantities, when the latter are determined from groups of observations whose divisions have respect to the changes of the equations of long period. The effects of alterations in the mean motions of longitude, of anomaly, and of argument of latitude, are not exhibited, because the corrections of these quantities can be deduced from the values of the corrections of epoch, of anomaly, and of argument of latitude, obtained at distant times.

"Omitting the effect of errors in all inequalities except those I have mentioned, every comparison gives an equation of condition in which the inequalities under consideration enter with their proper coefficients.

"The theoretical longitudes and ecliptic north polar distances with which the observed longitudes and ecliptic north polar distances are compared, are computed by Plana's theory, as far as regards the terms retained and their co-efficients (on which the most ample information will be found in the introduction to the *Reduction of Lunar Observations*), and from Damoiseau's tables as far as regards epochs and mean motions of every kind. Corrections to coefficients must, therefore, be applied to Plana's co-efficients, and corrections to epochs and mean motions must be applied to Damoiseau's epochs and mean motions."

The Astronomer Royal remarks, that the most legitimate mode of solving these equations of condition would be by the method of least squares; but the enormous trouble, the chance of numerical errors, and the necessity of checking the processes of calculation, have induced him to prefer the selection of groups, in which each unknown quantity enters with its positive or negative values. The immense number of recurrences of the incommensurable periods of the various equations running through such a long time makes this process very satisfactory, except in the case of variation and parallactic equation, of which the arguments depend on the difference of mean longitude between the sun and moon. As there are very few observations near conjunction, a modification is adopted in the mode of grouping the equations for those inequalities, which is a

good approximation to the method of least squares. The several groups of equations, with their respective solutions, are then given.

The Astronomer Royal then proceeds to shew in detail, how from his groups of equations the corrections of various constants are obtained. In some cases the observations shew a form not yet indicated by theory.

We have here only room for the results of this skilful handling of such apparently unmanageable masses.

1.*

Correction of Moon's Epoch of Longitude and Mean Motion.

Epoch of mean longitude, 1814 Jan. 1, 0^h Greenwich mean time	$44^g\ 23'\ 98''.2$
Motion in 365 days	$143\ 76\ 08\ .88$
Motion in 100 Gregorian years	$327\ 45\ 86\ .20$

2.

Equation depending on the elliptic form of the earth.

The whole of this inequality, the argument of which is the mean place of the moon's node, is

$$+6''.35 \text{ sin. long. moon's node} - 0''.97 \text{ cos. long. moon's node.}$$

The latter term is not recognised by theory, but its existence does not admit of doubt. The value seems well ascertained.

3.

Equation of the centre.

Coefficient of the sin. mean anomaly when the true longitude is expressed in a function of the mean longitude, as in Damoiseau's form..... $= 22639''.14$

Also the correction to the moon's longitude =

$$\{-0''.31 \text{ cos. long. node} + 0''.94 \text{ sin. long. node}\} \text{ sin. mean anomaly.}$$

4.

Correction of the epoch and motion of mean anomaly.

True epoch of anomaly for 1788, Jan. 1, 0^h Greenwich mean time	$= 110^g\ 59'\ 47''$
Motion of anomaly in 100 Gregorian years which appears very certain	$= 206\ 39\ 80$

The corrections to the moon's longitude =

$$\{+0''.19 \text{ cos. long. node} + 1''.65 \text{ sin. long. node}\} \text{ cos. mean anomaly.}$$

5.

Small terms depending on combinations of the mean anomaly and the longitude of node.

They may be put under this form:

$+0''.66$ sin. (mean anom. + long. node) $-0''.38$ cos. (mean anom. + long. node)

$-0\ .98$ sin. (mean anom. − long. node) $+0\ .56$ cos. (mean anom. − long. node)

---

* When the correction is to be applied to Damoiseau, it is given in *grades*, &c.; *i. e.* the circumference is divided into 400 grades, each grade into 100 parts, marked ', and each 1' into 100 parts marked 1''. This notation will be a sufficient guide.

6.

Correction of the coefficient of parallactic equation.

Corrected coefficient = 122″·37, but this is uncertain.

An empirical inequality would render the observations more accordant, but this has no probable physical foundation. The more likely cause for the observed irregularities is a change in the estimation of the moon's semi-diameter, depending on changes in the telescope or in the observer. From the law of the inequality this coefficient will always be somewhat uncertain.

7.

Correction of the coefficient of variation.

Corrected coefficient =2370″·98, which is somewhat uncertain, as depending in part on the estimated semi-diameter of the moon.

8.

Correction of the coefficient of annual equation.

True coefficient = 670″·29, pretty certain.

9.

Correction of the coefficient of evection.

True coefficient = 4586″·88, very certain.

10.

Determination of the correction to the constant term of parallax, remarks on the latitude of Greenwich, and on subjects related to it.

The Astronomer Royal here enters into a discussion which cannot be made intelligible if compressed.

The *whole* of the observations shew an error in the constant term of horizontal parallax, *i. e.* that it should be increased by 1″·78: the constant term would in this case be 3424″·94.

But the earlier and the later groups give different values of this correction, and again the colatitude in the earlier and later reductions is differently assumed. For the first 15 years, Bessel's colatitude, 38° 31′ 20″·40, was adopted, and for the last 16 years Airy's, 38° 31′ 21″·93, or somewhat more. Between these periods the colatitude may be said to have been assumed to increase uniformly, for Olufsen's index-errors of the quadrant, which have been followed, are obtained by comparing the places observed with those of the *Tabulæ Regiomontanæ*, which are interpolated between Bradley's places, colatitude 38° 31′ 20″·40, and Bessel's, which agree with those obtained by a latitude somewhat greater than 38° 31′ 21″·93.

The Astronomer Royal rejects the hypothesis of a real change in the colatitude owing to *partial* disturbances in the earth, as contradicted by the geological character of the country; and a change in the direction of the vertical from a *general* cause would disturb the sea-level in some parts of the world 100 feet. Neither is it possible, as he shews, from the admirable accordance of various modern observations, that any error can exist in the modern latitude of Greenwich. The solution of the difficulty is probably to

be found in the original imperfections of the Greenwich Quadrant,* and in its gradual degradations.

The Astronomer Royal, after proposing the best hypothesis of error which he can suggest, and bringing the later Cambridge and Greenwich observations to bear on the subject, concludes by saying, that probably Plana's constant term of parallax should be a little increased, and the moon's mass be correspondingly diminished. He proposes in the future reductions at Greenwich to increase Burckhardt's parallax by $\frac{1}{1200}$ part.

11.

Correction of the inclination of the moon's orbit: terms of long period in the inclination of the moon's orbit.

Inclination of the orbit = 18535″·46, very certain.

Inequalities of long period =

$-0''\cdot82$ cos. long. node $-2''\cdot02$ sin. long. node.

12.

Correction of the argument of latitude, and of the motion of the argument: terms of long period in the argument.

Epoch 1782, Jan. 1, 0^h Greenwich mean time, Argument of latitude ..... = $117^s\ 70'\ 14''$

Motion in 100 Gregorian years ..... = 76 44 12

Inequalities in argument of latitude =

$+25''\cdot71$ cos. long. node $-7''\cdot56$ sin. long. node.

13.

Small terms in the moon's latitude produced by the combination of the small terms of long period in the inclination and in the argument of latitude.

---

* Mr. Airy says, "Science is not always progressive; and this remark applies with great force to the construction of astronomical instruments. Long ago Roemer proposed a circle almost precisely similar to that now mounted in the Oxford Observatory. Flamsteed's mural arc, extending from the pole to the south horizon, was one step backwards. The Greenwich mural quadrant, scarcely extending beyond the zenith, was another and an enormous step backwards. The artistical talents of Graham and Bird, which, by the perfection that they introduced in the details of their instruments, gave popularity to a construction that is radically bad, may be considered as the greatest misfortune that has happened to astronomy. They undoubtedly retarded the progress of accurate astronomy for half-a-century." These remarks are unquestionably true, and it is difficult to conceive how Roemer's discoveries and successful practice should have been so much overlooked; but surely the persons to blame are the successive *Astronomers Royal*, Halley, Bradley, and Maskelyne, whose business it was to direct the kind of instrument to be constructed, and not to trust implicitly to the artist. Halley introduced the transit after Roemer, with whom he probably was acquainted. Horrebow's book, which appeared in 1735, must have been known to Bradley and Maskelyne. As it is in Latin, we might excuse the artists more completely if it were not illustrated with very tolerable plates.

As a confirmation of the remark of the Astronomer Royal, we may mention here that the solstitial circle described by Ptolemy, and probably invented by Eratosthenes, bears a close resemblance to the Greenwich mural circle; and that all the practical astronomers after this time seem to have misunderstood the proper construction of their tools till Roemer.

Neglecting two insignificant terms, and combining the rest with the term $-8''{\cdot}00$ sin. u, adopted in the theoretical calculations, the inequality depending on the earth's figure =

$$+2''{\cdot}17 \cos. u \quad -8''{\cdot}75 \sin. u.$$

The first term is not recognised by theory, but its existence is undoubted, and the magnitude approximate.

14.

Correction of the coefficient of evection in ecliptic north polar distance.

The corrected coefficient appears to be $527''{\cdot}26$, but the probability that this is more accurate than the present coefficient, $527''{\cdot}5$, is very small.

"The deductions which have here been drawn from the *Reduced Lunar Observations* are probably all that can be inferred from the annual groups which are printed at the end of that work. For examining into the existence or corrections of terms with different arguments, it will be necessary to refer to the individual observations as reduced. This operation will never be very laborious.

"An examination of the equations in the earlier part of this paper will shew that, in each equation, every term (except that which has been expressly formed with a large coefficient,) might have been neglected, without introducing important inaccuracy into the determination of the one unknown quantity affected by that large coefficient. In other words, when the changes of sign of an inequality are determined, it is only necessary to group the values of "excess of observed longitude," or "excess of observed ecliptic north polar distance," omitting all other numbers. The process therefore will be, assuming the inequality to depend upon the sine, to determine all the times when the argument has the values 0^g and 200^g; and, finding the mean of all the "excesses" between 0^g and 200^g, and the mean of all the "excesses" between 200^g and 400^g, to subtract the latter from the former, and to multiply the difference by $\frac{\pi}{4}$. If the inequality depend upon the cosine, the divisions of groups must be made for arguments 100^g and 300^g. If two arguments are closely related, it may be necessary to use some extraordinary caution, in the same manner as for the annual equation and variation."

Mr. Maclear has sent "the mean places of the 65 stars compared with Mauvais' second comet (*Mem.* R.A.S. vol. xv. pp. 244–7), together with their apparent places on the day of comparison."

"The stars compared with the comets of Wilmot and Gambart have been observed, and the reductions are in a forward state. These and the observations of Gambart's comet will be transmitted in the course of next month. The observations of *Neptune* will follow as soon as they can be got ready. The list of stars which Professor Mädler requested to have observed is nearly ready."

On the Difference in Longitude between the Observatory of Paramatta and Port M'Quarrie. By Capt. O. Stanley, R.N.

Captain Stanley employed ten chronometers, and transported them with the utmost care, avoiding all tremulous motion which might affect their going. He and Lieutenant Gule each carefully ascertained the error of the working watch at Sydney and Paramatta, and so obtained independent results, which are as follow :—

	Difference of Longitude.
By Captain Stanley.....	$52^{s}\cdot89$
Lieutenant Gule	52 ·85

This arc was measured by Sir Thomas Brisbane and M. Rümker, and again by Sir James Ross. Their results are $52^{s}\cdot74$ and $52^{s}\cdot41$ respectively.

Captain Stanley remarks, that there is a very perceptible personal equation between Lieutenant Gule and himself, in getting the time by equal altitudes with the sextant. Thus the errors of the working watch were, according to the two observers,—

		Capt. Owen. h m s	Lieut. Gule. h m s	Personal Eq^{n}. s
Sept. 1	Sydney	6 52 31·52	6 52 31·89	0·37
2	Paramatta	51 37·70	51 38·26	0·56
3	Sydney	6 52 30·05	6 52 30·71	0·66

Observations.

By Captain Bayfield, R.N. at his house, Charlotte Town, Prince Edward Island.

Occultations.

			Charlotte Town M.T. h m s	Longitude. h m s
1846 May 8	Spica	Imm.	9 31 43·72	4 12 32·03 W
		Em.	10 42 47·22	28·63
1847 Feb. 18	86 Piscium	Imm.	6 4 26·5	28·14
	B.A.C. 369	Imm.	6 5 14·5	31·68
April 20	51 Gemin.	Imm.	10 53 55·0	4 12 36·83

		° ′ ″
West longitude of Captain Bayfield's house	4 12 31·46 =	63 7 52
Observatory Bastion, Quebec, West of Charlotte Town.....		8 5 26
West longitude of Observatory Bastion, Quebec.....		71 13 18

" The time was well ascertained by equal altitudes before and after the observations, and carried on by ten chronometers. The emersion of *Spica* being at the bright limb, is probably two or three seconds late.

" The corrections of the moon's place have been furnished by the Astronomer Royal, and applied in the computations."

The following eclipses of *Jupiter's* first satellite have also been observed by Captain Bayfield at the same place.

Immersions.

			Charlotte Town M.T. h m s	Longitude. h m s
1846	Oct.	8	9 7 27·20	4 12 23·10 W
		31	9 16 54·79	23·71
	Nov.	7	11 10 32·42	40·78
1847	Oct.	27	10 44 12·47	4 12 36·63
			Mean ...	4 12 31·05

Emersions.

			Charlotte Town M.T. h m s	Longitude. h m s
1843	August	27	9 47 46·11	4 12 24·19 W
1844	Jan.	14	5 50 23·13	21·67
1846	Feb.	4	10 56 36·30	27·00
1847	March	4	9 0 14·72	28·08
		20	7 20 55·52	24·08
1848	Jan.	22	6 10 38·72	4 12 23·18
			Mean	4 12 24·70 by Em.
				31·05 by Imm.

West longitude of Charlotte Town ..... =	4 12 27·88	= 63° 6′ 58″
Observatory Bastion, Quebec, West of Charlotte Town	.....	8 5 26
West longitude of Observatory Bastion, Quebec	.....	= 71 12 24

"The above eclipses were observed under favourable circumstances, with the same telescope and by the same observer."

Observations to determine the Latitude of Dera and the disturbing force of the Himalayas. By Captain Shortrede.

The latitude observations were made at Dera in 1841 with a 12-inch vertical circle of an altitude and azimuth circle, by Troughton and Simms, read by microscopes, and having a telescope 20 inches' focus, with 1·8 inch aperture.

Several altitudes of the stars were observed on each face, and near the meridian, to which they were reduced. The error and rate of the chronometer were found by transits of stars on opposite sides of the zenith.

The accordance of the observations, which are sufficiently numerous, is very satisfactory. The mean of the northern stars gives the latitude 30° 19′ 19″·93 N. of the southern stars 23″·81,

and the mean of both 21″·87. By combining, in pairs, the north and south stars which have nearly the same zenith distance, Capt. Shortrede finds the latitude 30° 19′ 22″·8 N., which result he conceives cannot well be 1″ from the truth.

The place of Captain Shortrede's observations is about 100 feet due west from the chimney of the Surveyor-general's office at Dera. This chimney is fixed by triangulation from the great Indian arc, in the series which passes northward from Kalianpur through Kaliana to Banog. From Banog to the snowy peaks of the Himalayas is about 50 miles.

		°	′	″
The latitude of Kalianpur	=	24	07	11·84 N. by observation.
,, Kaliana	=	29	30	48·90 N. ,,
Difference	=	5	23	37·06
But this difference is by triangulation	=	5	23	43·49
Or the two results disagree by				6·43 in 323″·6

This arc adjusted by Colonel Everest, in calculating his latitudes from survey, by shortening the distances about 2 feet on 1′ of latitude (see his measure of the Indian arc, p. clxx), and he uses the same allowance in calculating the latitude of Banog from the triangulation.

Captain Shortrede proceeds thus to establish the amount of local disturbance in the latitude of Dera,—

		°	′	″	
Banog is		0	57	42·18	north of Kaliana, by *survey*.
Dera is		0	8	37·53	south of Banog, ,,
Or Dera is		0	49	4·65	north of Kaliana, by *survey*.
Latitude of Kaliana		29	30	48·89	by *observation*.
Latitude of Dera	=	30	19	53·54	derived from Kaliana and survey.
	=			22·78	by Capt. S.'s observations.
Difference				30·76	

Which seems to arise from the difference of the attraction of the Himalayas at Kaliana and Dera.

By comparing the differences between the azimuths, as observed and calculated from Kaliana to Banog, Capt. S. finds the deflection in azimuth at Banog to be about 15″·16, but not very certain, *i.e.* it may be in error ±1″.

Captain Shortrede now assumes that the disturbing effect of the Himalayas may be compared to that of a fixed centre of attraction, and proceeds to find the direction and distance of a centre of attraction which would alter the latitude and azimuths in the same way, and to the same amount, that they are found to be altered. He finds a fixed position for a centre of attraction on the above hypothesis, which will change the latitude 30″·76 between Kaliana and Dera, and also change the azimuth 15″·16 between Kaliana and Banog.

"The assumption of a fixed centre of attraction is not faultless, but as matters stand it may serve as an approximation not likely to be greatly erroneous, for on any of the above suppositions the extreme difference in the values of its direction is under 8°, and

for so small a variation in aspect, the error in the assumed fixity is not likely to be great."

To find the Error and Rate of a Chronometer from the observed Transits of Three Stars near the Meridian. By Capt. Shortrede.

This is not a problem of frequent occurrence, but it did present itself to Capt. Shortrede on the first day of his observations at Dera.

His solution is to the following effect: — The transit is supposed to be adjusted for level and collimation, or, which is the same thing, the observations are corrected for these errors. Each observation, when compared with the apparent R.A. of the star, furnishes an equation with three unknown quantities, viz. the *clock error* at the first observation, the *azimuthal error* with a known coefficient (the latitude being known approximately), and the *rate*, which has for a co-efficient the time from the first observation. From these equations the azimuthal error and clock error may easily be deduced if the stars be properly selected; and the rate will be found, unless the stars observed are too near the pole, or follow each other too closely. It would generally be more advisable to get the *rate* from one or more pairs of known stars near the equinoctial, the first of each pair being observed at the beginning and the last at the end of the night's work.

Captain Shortrede wishes it to be remarked "that the limitation in M.N. p. 160, with respect to the polar distance of the star, is unnecessary when the elongations are observed on both sides of the meridian. Errors in the assumed latitude or polar distance of the star will, in this case, correct each other."

Extract of a Letter from Dr. Lee to the Secretary.

"I take leave to offer to the Society for its acceptance an original painting of Mr. Joseph Middleton, who founded, in 1717, the respectable and useful Society of Mathematicians in Spitalfields; the worthy surviving members of which, by the recent act of union, are now Fellows of the Royal Astronomical Society.

"Little is known concerning the life and adventures of this worthy man. It is conjectured that he was the mate or captain of a vessel in the merchant service, and that in the later portion of his life he gave instructions in mathematics, and particularly in those branches which relate to navigation, in the neighbourhood of Spitalfields.

"In the Library of the late Mathematical Society is a manuscript in folio, relating to arithmetic, algebra, and navigation, which is supposed to have belonged to and to have been composed

by him: from the contents of this volume he probably gave his lectures. It is believed that he died between 1725 and 1730.

"Since this portrait came into my possession it has been repaired by Mr. Edwin Holder, a skilful artist, from a copy which was made at the request of the Mathematical Society by Mr. Saubergue, about the year 1835.

"The copy is in my possession, and it agrees in its general character with the original, and differs in some of the minor details.

"I am informed by Mr. Williams that Mr. Saubergue was an artist of much merit, and that he died at the age of twenty-four."

"Mr. T. B. Honegger, architect, has discovered, at HAMAM EL BAS, 72 geographical miles from Tunis, a fragment of a Punic monument upon which a constellation * is represented by round holes of equal size over three figures in relief. The middle figure is a female, barefooted, with naked arms, and wrapped up in a long garment; a tower-crown is upon her head, to which the royal cloak is fastened, which hangs over her shoulders and knees. In her right hand she holds a large artichoke, and in the left a double cornucopia, with the hasta which rests on the head of a ram at her feet. On her right hand stands Mars, and on her left Mercury.

"From the time of planting the artichoke and shearing sheep in that country (to which it is conjectured that the abovementioned symbols refer), it may be thought probable that the figure represents the goddess Athir and the month April."

Mr. Hind says,—"Since June 30 the *new star* has appeared of the 7·8 mag., and is therefore very slowly diminishing. Its colour is still very red."

Mr. Woolgar remarks,—"There is a considerable difference in the estimated magnitude of another star in the same neighbourhood:—

✱ = Bode 152 *Oph.*	6	mag., *his own observation.*
= H.C. 31341	8	—
= Weisse xvii. 110	7·8	—

M. Rümker remarks, "that there is a star of the ninth magnitude twice observed by Lalande, and also by Bessel, of which the apparent place is, according to Bessel,

1848, July 2. R.A. $22^h\ 21^m\ 2^s{\cdot}65$. N.P.D. 100° 42′ 23″·3.

"Now close to this star I find another star of the seventh magnitude, mentioned neither by Lalande nor Bessel, the apparent place of which is

1848, July 2. R.A. $22^h\ 21^m\ 2^s{\cdot}51$. N.P.D. 100° 42′ 19″.

---

* The configuration is given of 7 stars, which somewhat resemble the square in *Pegasus*.

" It is scarcely reasonable to suppose that both Lalande and Bessel made such a mistake in the magnitude of the star, as to set it down as of the ninth while omitting the companion. It has no motion, so is probably a changing star."

Errata communicated by Mr. Woolgar.

P. 156, *for* Weisse's Bessel xvi. 956 *read* xvi. 962.
157, line 1, — Piazzi xvii. 191, — xvi. 191, 20 *Ophiuchi*.

The star " of about 6 magnitude," mentioned just afterwards, is H.C. 31188 = Bode 133 *Ophiuchi*, 5 mag.

Errata in the Monthly Notice for May.

Page 147, line 4, *for* " St. Vidart," *read* " St. Vidast."
161, 13 from the bottom, *for* " 1542," *read* " 1548."

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